

Point-of-care CRP and glucose testing in general practice

Summary

Background: Point-of-care tests (POCT) are diagnostic tests carried out in the immediate vicinity of a patient, which means that the sample is collected and analysed, and the results are issued at the same location. POCTs enable to reduce the time from sample taking to receiving test results and making treatment decisions, but direct medical benefit of POCTs depends primarily on whether the reduced time improves treatment quality and outcomes.

Objective: To evaluate the effectiveness and cost-effectiveness of point-of-care C-reactive protein (CRP) and glucose testing compared to standard practise in Estonia.

Methods: A systematic literature review of the effectiveness of CRP and glucose POCTs was composed based on a PubMed literature search. A meta-analysis comparing the effectiveness of CRP POCT to standard practice, where standard practice was defined as laboratory testing, no testing or testing at doctors discretion, was performed. A systematic literature review of the cost-effectiveness of both POCTs was also conducted. Estonian cost-effectiveness calculations were performed for the use of CRP POCT in all patients presenting to a general practitioner (GP) with symptoms of acute respiratory tract infection (ARTI) compared to standard practice, which in Estonia means that GPs determine CRP at their own discretion. The analysis employed a short, four week, time horizon. Diagnostic test and infection treatment costs were calculated using Estonian Health Insurance Fund (EHIF) data, whose perspective the analysis employed. Health effects were measured both as the proportion of patients receiving antibiotic treatment and quality-adjusted life-years (QALYs). Results were presented as an incremental cost-effectiveness ratio (ICER). Due to the lack of effectiveness evidence, cost-effectiveness analysis of glucose POCT could not be performed.

Results: The relevant published literature on the effectiveness of POCTs showed low-quality evidence that CRP POCT has an effect on reducing antibiotic prescribing in children and adults with symptoms of ARTI at the initial GP visit and within four weeks of the initial visit. The meta-analysis did not confirm the effectiveness of using CRP POCT on reducing hospital referrals or re-consultations. There were no randomized controlled trials evaluating the health benefit of using glucose POCT in primary care. Based on studies with other designs and methodologies, no conclusions could be drawn about the effectiveness of glucose POCTs.

In the Estonian cost-effectiveness analysis, the use of CRP POCT compared to standard practice reduced antibiotic prescribing by 16% and enabled to gain 0.0019 QALYs. In addition CRP POCT enabled to save on antibiotic treatment cost, with a lower overall cost compared to standard practise. Therefore CRP POCT was less costly and more effective compared to standard practise.

Conclusions: The results of this analysis cannot be expanded to all POCTs. From the perspective of the Estonian public health system, it is crucial that all the POCTs used are validated and effective.

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